

WHAT IS CLAIMED IS:

1. A perpendicular magnetic recording medium comprising:

a substrate;

5 an underlayer formed on the substrate, and containing at least one element selected from the group A consisting of Pt, Pd, Rh, Ag, Au, Ir and Fe, and at least one element or compound selected from the group B consisting of C, Ta, Mo, W, Nb, Zr, Hf, V, Mg, Al, Zn,
10 Sn, In, Bi, Pb, Cd, SiO₂, MgO, Al₂O₃, TaC, TiC, TaN, TiN, B₂O₃, ZrO₂, In₂O₃ and SnO₂; and

a magnetic layer formed on the underlayer, containing at least one element selected from the group consisting of Fe, Co and Ni, and at least one element
15 selected from the group consisting of Pt, Pd, Au and Ir, and containing crystal grains having an L1₀ structure.

2. The medium according to claim 1, wherein the crystal grains having the L1₀ structure in the magnetic
20 layer are mainly {001}-oriented.

3. The medium according to claim 1, wherein crystal grains in the underlayer are mainly {100}-oriented.

4. The medium according to claim 1, wherein the
25 underlayer contains at least one element or compound selected from the group B within a range from 0.1 mol% to 50 mol%.

5. The medium according to claim 1, wherein the magnetic layer contains at least one element or compound selected from the group B.

5 6. The medium according to claim 5, wherein the magnetic layer contains at least one element or compound selected from the group B within a range from 0.1 mol% to 40 mol%.

10 7. The medium according to claim 1, further comprising a seed layer between the substrate and the underlayer.

8. The medium according to claim 1, further comprising a crystal orientation layer between the substrate and the underlayer.

15 9. The medium according to claim 8, wherein the crystal orientation layer containing Cr and at least one element selected from the group C consisting of Ti, Ni, Co, Cu and Zn.

20 10. A medium according to claim 9, wherein the crystal orientation layer contains at least one element selected from the group C within a range from 0.1 mol% to 50 mol%.

11. The medium according to claim 8, further comprising a seed layer between the substrate and the crystal orientation layer.

25 12. The medium according to claim 1, wherein the magnetic layer has a thickness of 200 nm or less.

13. The medium according to claim 12, wherein the

magnetic layer has a thickness ranging from 0.5 nm to 50 nm.

14. The medium according to claim 1, further comprising a protective layer on the magnetic layer.